MULTIMEDIA UNIVERSITY

STUDENT ID NO

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# MULTIMEDIA UNIVERSITY

# FINAL EXAMINATION

**TRIMESTER 3, 2021/2022**

## BPO 2064 – PRODUCTION AND OPERATIONS MANAGEMENT

(All sections / Groups)

18 AUGUST 2022
9.00 a.m. – 11.00 a.m.
(2 Hours)

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**INSTRUCTIONS TO STUDENTS**

1. This Question paper consists of 8 pages (including cover page) with 9 Questions only.

2. Answer ALL questions. The marks distributions are given in parentheses.

## SECTION (A)

## QUESTION 1

Lagoon Seafood makes 1000 wooden packing boxes for fresh seafood per day, working in two 10-hour shifts. Due to increased demand, plant managers have decided to operate three 8-hour shifts instead. The plant is now able to produce 1300 boxes per day.

a) Calculate the company's productivity before the change in work rules and after the change. (2 marks)

b) What is the percentage increase in productivity? (2 mark)

c) If production is increased to 1400 boxes per day, what is the new productivity?

(2 mark)

## QUESTION 2

a) Arnord Delivery Software is marketed to small transportation firms throughout Asia. Owner Ean Lim has decided to outsource the company's help desk and is considering three providers: Bangkok Call Center (Thailand), Jakarta Services (Indonesia), and South Korea (Seoul). The following table summarizes the data Ean has assembled. Which outsourcing firm has the best rating? (Higher weights imply higher importance and higher ratings imply more desirable providers.)

| Criterion | Importance Weight | Provider Ratings | | |
|---|---|---|---|---|
| | | Bangkok | Jakarta | Seoul |
| **Flexibility** | 0.4 | 6 | 2 | 9 |
| **Trustworthiness** | 0.2 | 4 | 2 | 2 |
| **Price** | 0.2 | 5 | 7 | 6 |
| **Delivery** | 0.2 | 3 | 6 | 6 |

(6 marks)

b) Identify 2 main advantages of outsourcing. (2 marks)

c) Identify 2 disadvantages of outsourcing. (2 marks)

**Continued ...**

## QUESTION 3

Residents of Nami River have fond memories of ice skating at a local park. An artist has captured the experience in a drawing and is hoping to reproduce it and sell framed copies to current and former residents. He thinks that if the market is good he can sell 500 copies of the elegant version at $150 each. If the market is not good, he will sell only 400 at $105 each. He can make a deluxe version of the same drawing instead. He feels that if the market is good he can sell 600 copies of the deluxe version at $170 each.

If the market is not good, he will sell only 500 copies at $125 each. In either case, production costs will be approximately $45,000. He can also choose to do nothing.

a) If he believes there is a 50% probability of a good market, what should he do? (10 marks)

b) Explain why he should choose the option in answer a)? (4 marks)

## QUESTION 4

a) Describe the three forecasting time horizons and their use. (9 marks)

b) What are the three realities of forecasting that companies face? (6 marks)

## QUESTION 5

a) As the corporate and operations management strategies vary from low cost to response to differentiation, how does this impact the criteria used for selecting suppliers? (9 marks)

b) Identify the advantages and disadvantages of using the "few suppliers" sourcing strategy. (6 marks)

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## SECTION (B)

### Question 1

Identify the three approaches companies use to ensure a successful transition from product development to production. (4 marks)

### Question 2

a) Differentiate between a push and a pull system. (6 marks)

b) A product has annual demand of 100,000 units. The plant manager wants production to follow a four-hour cycle. Based on the following data, what setup cost will enable the desired production cycle?
d = 400 per day (250 days per year), p = 4000 units per day,
H = $100 per unit per year, and Q = 200 (demand for four hours, half a day).

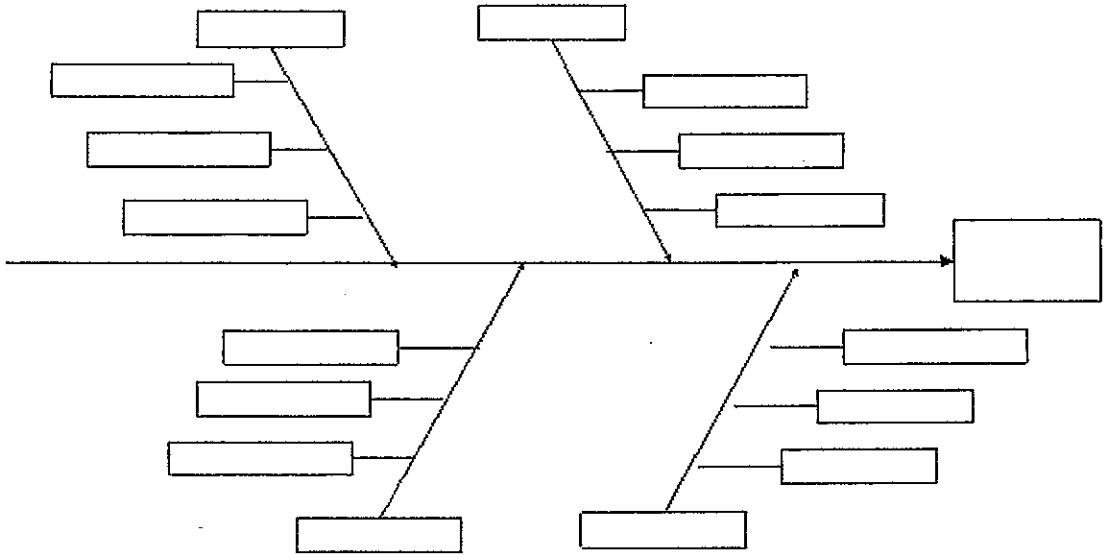
$$Q = \sqrt{\frac{2DS}{H(1-d/p)}}$$

(5 marks)

**Continued ...**

## Question 3

Pretend that you have just come from a relative's wedding reception. It didn't turn out as well as it should have, and the bride's parents are pretty mad at how things turned out. Use the supplied template to construct a conventional cause-and-effect diagram. Identify twelve sources of defects for the issue "dissatisfied customer of wedding reception caterer." (Your dozen need not be exactly three per main cause, but should be a balanced treatment.) Categorize each cause onto a main cause. Provide brief support for each of your choices. (10 marks)



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## Question 4

**Make Versus Buy Case**

ABC Ltd. is a manufacturing company engaged in the manufacturing of valves. They have been in the business for last 3 years and have been manufacturing only one type of valves. They started their business initially with sales of 10,000 valves per month and now they have grown the volume to about 50,000 valves per month. They have been buying all the raw material for the valve and were doing all the manufacturing in house. Now they have established themselves in the market and are planning to expand and produce different varieties of valves. They have their plant in the main city and the total area of the plant is 50,000 sq. ft. Now if they want to expand and continue doing all the activities of manufacturing of all the varieties in house, they would need another 50,000 sq.ft. of the area. In the recent times, the land prices in the area have more than doubled in the last 3 years and still land is available with great difficulty. Mr. Mohan is the production head of ABC Ltd. and has been successful with the production and the level is continuously increasing. But in recent times, he is facing the problem of quality complaints which have gone up from average 0.2 % in previous 2 years to 0.5 % this year. Also, he is finding that there is a high level of dissatisfaction among the workers regarding workload as well as salary levels. The workers are regularly complaining about the over work. Although, Mr. Mohan has found that the workers have been spending lot of time on tea breaks, lunch breaks and even in between the production spending lot of time talking to each other. But, due to insufficient workers and staff, he is unable to take strict action and the workers are taking advantage of this situation. For completing the work and delivering the products timely, he has to employ workers on overtime and his overtime cost has also increased 3 times. Mr. Mohan is worried about the new expansion plan of the management and is worried where the new workers would come from as he is already finding shortage of workers for the existing job. He has requested the management not to go for expansion immediately and look at improving and consolidating the existing set up. He has sent his request to Mr. S. Kumar Director – Operations. Mr. Kumar has gone through the request of Mr. Mohan and

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called a meeting of all the d epartment heads and explained the situation to all concerned. After few rounds of meeting from Production, Sales & Purchasing, the Head of Department agreed with the data below:

**In house Manufacturing Cost**

| Year | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|
| **Quantity (Annual)** | 300,000 | 500,000 | 700,000 | 900,000 | 1,000,000 | 3,400,000 |
| **Mat Cost/unit** | 14.00 | 15.40 | 16.94 | 18.63 | 20.49 | |
| **Labor Cost/unit** | 4.00 | 3.60 | 3.60 | 3.96 | 4.35 | |
| **Indirect Labor Cost/unit** | 2.00 | 1.80 | 1.80 | 1.98 | 2.17 | |
| **Power & Fuel Cost/unit** | 2.00 | 2.20 | 2.42 | 2.66 | 2.92 | |
| **Variable Cost/unit** | 22.00 | 23.00 | 24.76 | 27.23 | 29.95 | |
| **Total Variable Cost/year** | **6,600,000** | **11,500,000** | **17,332,000** | **24,512,400** | **29,959,600** | **89,904,000** |
| **Supervisor Salary/year** | **60,000** | **66,000** | **72,600** | **79,860** | **87,846** | **366,306** |
| **Machine Cost/year** | **1,000,000** | **1,000,000** | **1,000,000** | **1,000,000** | **1,000,000** | **5,000,000** |
| **Total cost/year** | **7,660,000** | **12,566,000** | **18,404,600** | **25,592,260** | **31,047,446** | **95,270,306** |

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**Warehouse Cost (Outsource)**

| Year | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|
| **Quantity (Annual)** | 300,000 | 500,000 | 700,000 | 900,000 | 1,000,000 | 3,400,000 |
| **Mat Cost/unit** | 20.00 | 20.00 | 22.00 | 24.20 | 26.62 | |
| **Transport Cost/unit** | 2.00 | 2.20 | 2.40 | 2.60 | 2.80 | |
| **Inventory Cost** | 1.00 | 1.00 | 1.10 | 1.21 | 1.33 | |
| **Variable Cost/unit** | 23.00 | 23.20 | 25.50 | 28.01 | 30.75 | |
| **Total Cost/year** | **6,900,000** | **11,600,000** | **17,850,000** | **25,209,000** | **30,751,000** | **92,310,000** |

a) Based on this data, is it economical for ABC Ltd.to go for buying the product from market or manufacturing in house? (2 marks)

b) What other factors should ABC Ltd. look at for making this decision?

***factors generally influence make-or-buy decisions**

(13 marks)

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